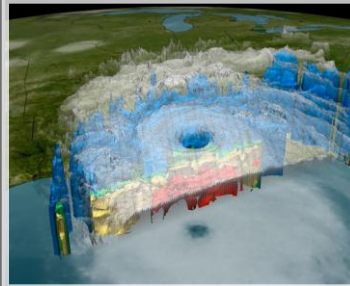
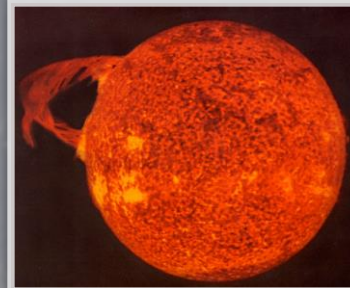
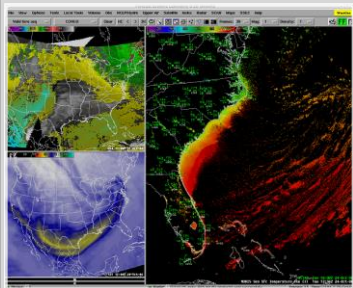


# Building a Weather-Ready Nation – NWS Progress Report Overview



**Dr. Louis W. Uccellini**

**Director, National Weather Service**

**January 14, 2016– NWS Partners Meeting**



# Outline

- **Baseline**
- **NWS Road to Recovery**
- **FY16 Enacted Budget**
- **Portfolio Highlights**
- **Computer Status/Model Implementation**
- **National Water Center**
- **Dissemination Advances**
- **National Water Center**
- **Impact-based Decision Support**
- **Vision Becoming Reality**



# Baseline: 2012 to 2013

- Operational computer – under resourced, Model Upgrades/Implementations – lagging
- Dissemination systems subcritical – not sustainable during November 17, 2013 severe weather outbreak and Dec 2013 storm event
- Travel – slashed; including local travel for operational support
- Training – slashed
- Conference attendance – minimized
- Facilities in disrepair
- CSTAR on life support
- Vacancies worsened by sequestration threat



# NWS Road to Recovery

- Embrace NWS Strategic Plan
- Budget Restructuring
- Headquarters Reorganization
- Corporate Governance





# NWS Strategic Outcome: A Weather-Ready Nation

Becoming a Weather-Ready Nation is about building **community resiliency** in the face of increasing vulnerability to extreme weather, water and climate events.

***“Ready, Responsive, Resilient”***

## REQUIRES NWS TO:

- Fully integrate our field structure to produce:
  - *Better forecasts and warnings*
  - *Consistent products and services*
  - *Actionable environmental intelligence*
- Provide Impact-based Decision Support Services (IDSS)
- Deliver through multiple and reliable dissemination pathways
- Work with partners to **gain needed response**; includes embedding NWS in Emergency Operations Centers and incorporating Social Sciences



**We have 2200  
WRN Ambassadors**

***Involves entire US Weather, Water and Climate Enterprise WORKING TOGETHER  
to achieve far-reaching national preparedness for weather events***



# Evolving to Build a Weather-Ready Nation

*Evolving is a journey ... not a destination!*

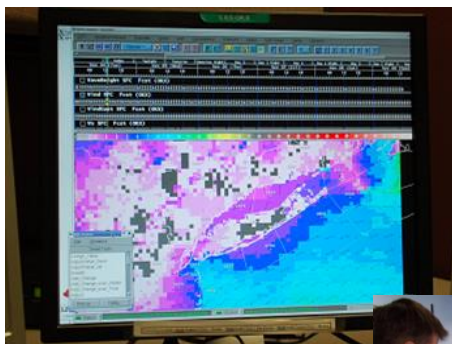
Generating  
forecasts  
and warnings



Connecting those  
forecasts/warnings with  
impacts



**IDSS**



Forecast and  
Warning  
Products

Practice,  
Practice,  
Practice!



Personal relationships



Impact-based **D**ecision  
**S**upport **S**ervices



©The GOMET Program

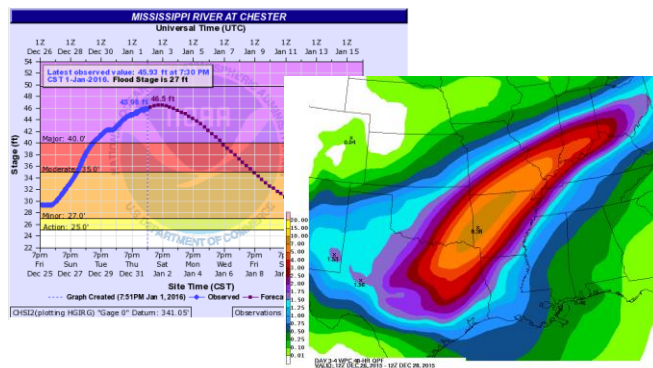


# Extending Decision Support Services *Holiday Storm 2015*



FEMA Prepositions  
recovery assets

Headlined impactful event  
6 days in advance



State & local  
Emergency Managers  
prepare local communities

Excellent collaboration among NWS  
weather & water forecasters, NOS  
National Geodetic Survey



State & local authorities harden  
priority assets & respond to  
event

Provided on-site decision  
support service to FEMA, state,  
local emergency ops centers

Flood forecasting support  
continues

Days to Event

| 6 | 5 | 4 | 3 | 2 | 1 | *Event*

Providing Impact-based Decision Support Services must account for  
“shifting risk preferences” and related options.





# New Planning & Budget Structure Increases Transparency and enhances Service Delivery

## Observations

Joe Pica

- A focused effort on sustaining & integrating all observations supporting the NWS mission and ensuring continuous situational awareness.

## Central Processing

David Michaud

- Fully integrating the central and distributed computing system from central computer to AWIPS/AHPS

## AFS

Andrew Stern

- Analyze, Forecast, Support includes all NWS forecast offices:
- Working toward “fully integrated field structure” providing consistent products & services
- Supports local/national IDSS, outreach, & social science integration (*nature of work will change*)

## Dissemination

Luis Cano

- Better managed, reliable, centralized, and more responsive network, especially during high impact events.

## STI

Ming Ji

- Accelerates numerical model advances, supports forecaster training/development
- Provides a centralized development environment to enable Research to Operations (R2O) & a visible “catcher’s mitt” for the rest of the research community interested in the R2O process (e.g., CSTAR, SOO/DOH ...)

## Facilities

Deirdre Jones

- Make sustaining all of the NWS facilities a fundamental part of the NWS mission execution

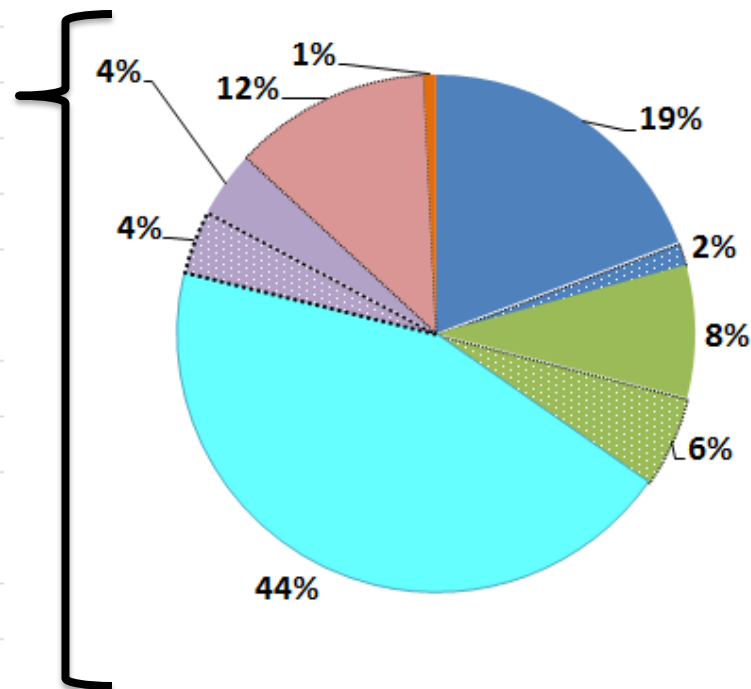




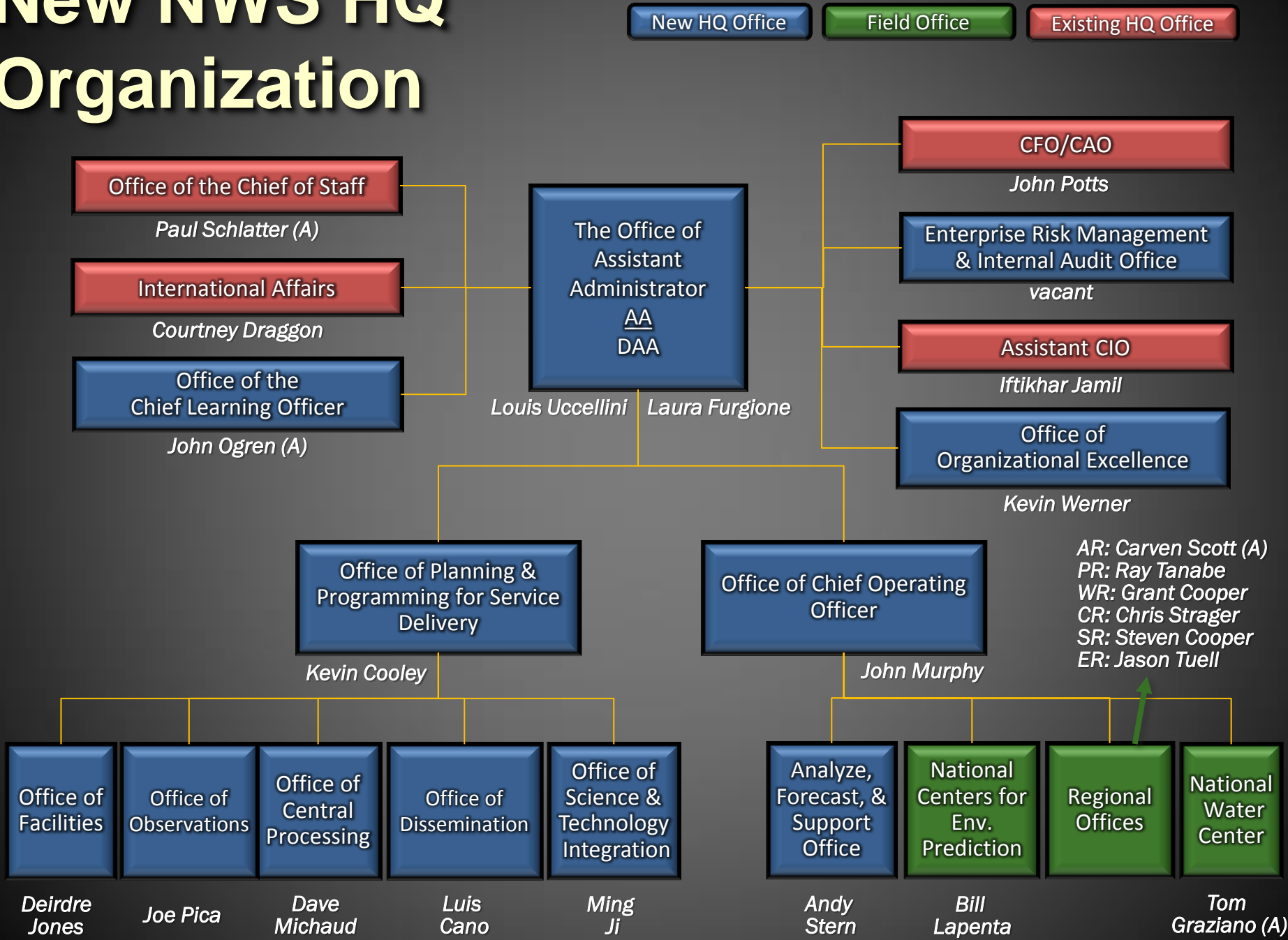
# FY2016 NWS Enacted Budget Composition by Portfolio

## Funds Breakdown

Programs, Projects and Activities	\$ thousands	FTE
Observations ORF	\$ 216,363	804
Observations PAC	\$ 16,720	0
Central Processing ORF	\$ 92,871	232
Central Processing PAC	\$ 64,261	22
Analyze, Forecast and Support ORF	\$ 496,031	3,010
Dissemination ORF	\$ 44,743	82
Dissemination PAC	\$ 45,684	0
Science and Technology Integration ORF	\$ 138,826	488
Facilities PAC	\$ 8,650	0
<b>Total</b>	<b>\$ 1,124,149</b>	<b>4,638</b>



# New NWS HQ Organization





# Portfolio Highlights

## Observations

- JPSS/GOES-R Readiness
- NEXRAD Service Extension
- Autosonde Testing
- Buoys sustained

## Central Processing

- Central Computer Upgrade
- AHPS
- AWIPS Evolution

## STI

- Model upgrades: GEFS, HWRF, NWPS, Global.Wave
- HEFS implementation in RFCs
- Exp. Graphic Storm Surge Watch/Warning
- Exp. Winter Wx days 4-7 outlook
- Exp. Arctic Sea Ice Outlooks,
- Grants: CSTAR/NGGPS/HFIP/Testbeds (\$4.7M FY16)

## Facilities

- Bannister Facility Relocation
- First one-third Facility Condition Assessment



**WRN Ambassador Initiative**  
2200 Ambassadors

## Dissemination

- “One NWS Network”
- NOMADS, MAG, MADIS, MRMS, nowCOAST, [www.weather.gov](http://www.weather.gov)

## AFS

- Impact-based Decision Support
- Hazard Simplification
- National Impacts Catalog
- Enable Ecological Forecasting
- Weather/Climate linkage (e.g., week 3-4 outlooks)
- Storm Surge Watch/Warnings
- Probabilistic Winter Outlooks



# Computer Status/Model Implementation Supported through HFIP and Sandy Supplemental

Increased HPC capacity to 2.8 petaFLOPs

(for primary and backup, respectively—for a total of 5.6 PF) - Implemented

## Key Atmospheric Model Upgrades Complete:

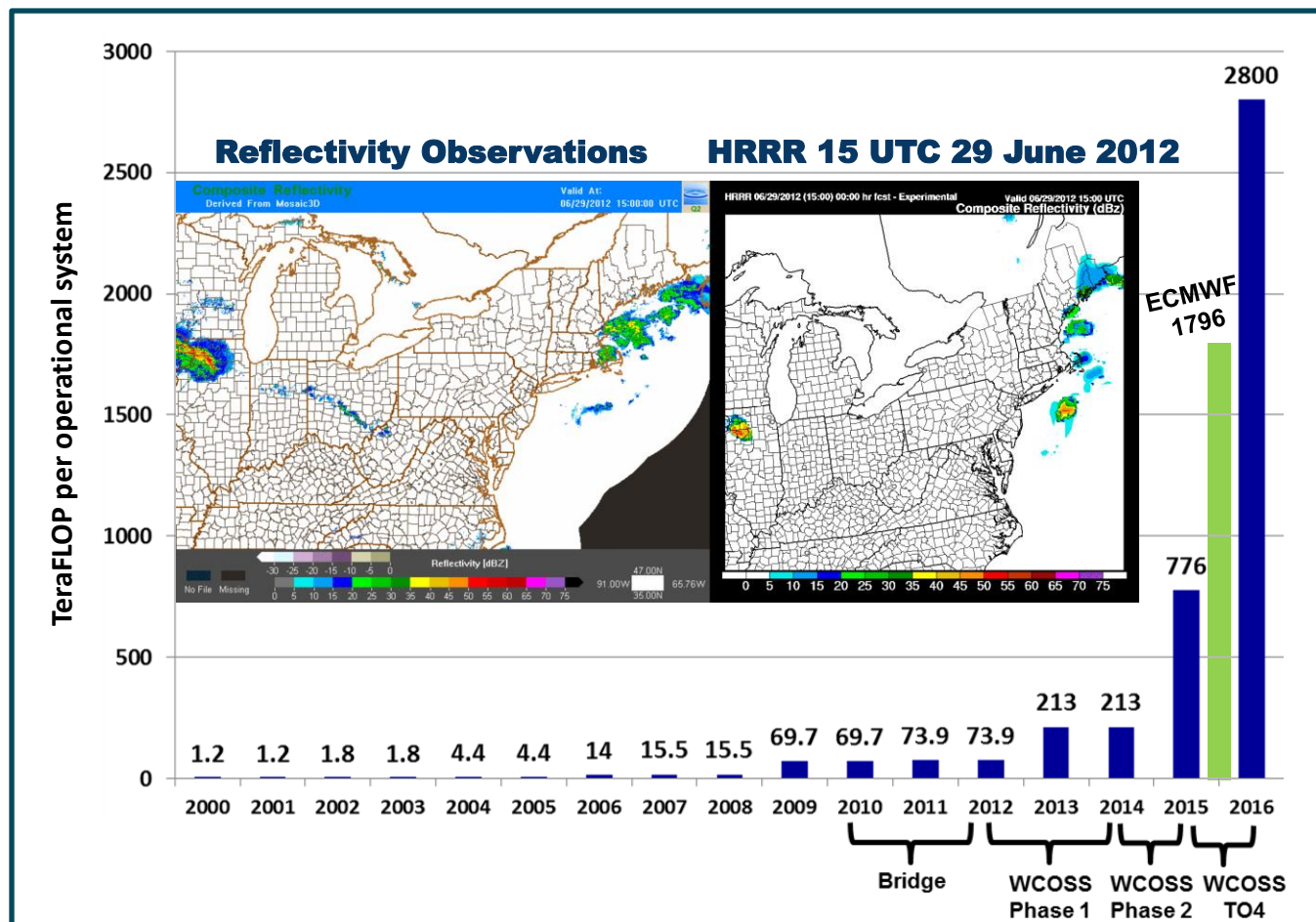
- Sept 2014: High-Resolution Rapid Refresh (HRRR) operational – 3km every hr.
- Jan 2015: Global Forecast System (GFS) upgraded – 13km out to 10d.
- June 9, 2015: 2km HWRf
- September 2015: SREF, GEFS

## Upcoming Model Upgrades:

- GFS/4D ENKF
- HRRR v2.0 (HRRRe)
- HWRf – Storm Surge

## HPC-Based Water Modeling:

- Deploy WRF-Hydro v1.0 on WCOSS (FY16)







# National Water Center

## Initial Operating Capability: May 26, 2015



**VISION:** Scientific excellence and innovation driving water prediction to support decisions for a water resilient nation.

### **BENEFITS:**

- State-of-the science modeling for global to street level predictions (*from 6,000 forecast locations to 2.7 million stream reaches*)
- Operations Center to establish common operating picture within NOAA and among water agencies; decision support for floods to droughts (*flood mapping to street level*)
- Proving ground to accelerate research to operations; partnerships with research communities (e.g. *CHUASI, National Flash Flood Interoperability Experiment*)
- Data integration and service backup

# Dissemination NWS Network Updates

## "One NWS" Network

100% Dissemination  
Backup with College Park  
and Boulder

1. Fit-up at IDP Infrastructure in Boulder spaces – Completed
2. IT Equip Install in Boulder – Completed
3. Failover set-up between College Park and Boulder for MAG, FTPPRD, and NOMADS – Mar 2016

IDP Dissemination  
Site DSRC  
(Boulder, CO)

IDP Dissemination  
Site NCWCP  
(College Park, MD)

Network "Backbone"

Supercomputer  
(Reston, VA)

Supercomputer  
(Orlando, FL)

Functionality already  
in place at College  
Park

- NOMADS
- FTPPRD
- MADIS
- MRMS
- MAG
- VLAB
- Weather.gov
- nowCOAST
- DataStreame

WFOs  
122/122 upgr

RFCs  
13/13 upgr

National  
Centers (upgr)

Internet

External  
Partners

CWSUs

The future One-NWS network will consolidate all operational networks (OPSnet, Regional, etc.) under a single managed network.



# Introduction to the Operations and Workforce Analysis (OWA) project

NWS has contracted McKinsey & Co., a global strategy and management consulting firm, to conduct the Operations and Workforce Analysis project.



- 1 Stakeholder Engagement and Change Management
- 2 Evaluation of IDSS
- 3 Current Profile Baseline Staffing
- 4 Gaps
- 5 Recommendation of Alternatives
- 6 Implementation Planning



# Vision Becoming Reality

- Building a Weather-Ready Nation is ongoing and involves over 2200 WRN Ambassadors
- NWS Budget/HA/Governance restructuring in place supporting advances across all portfolios.
- IDSS generally embraced by NWS forecasters and partner agencies (federal, state, local)—working through the Operations and Workforce Analysis (OWA) to establish “swim lanes”
- Science-based services: Earth System Science → Social Science
- NWS also reaching out to larger research/operational enterprise for Next Generation Global Prediction System (NGGPS)
- Given dedication of the workforce, their commitment to mission, and progress being made across all budget portfolios, I believe the NWS is positioned to be a weather agency that is “Second to None.”
- FY 2016 will be the year that will be recognized for turning the arrow pointing up for the NWS as it serves the Nation and the weather, water and climate enterprise.



# Thank you

